

I (WE) CLAIM:

1. An ultrasound transducer with a shield imparting at least one of environmental and electromagnetic protection, the transducer comprising:
 - a first transducer element;
 - a second transducer element adjacent to the first transducer element, a first kerf separating the first transducer element from the second transducer element;
 - and
 - a shield layer over at least portions of the first transducer element, the second transducer element and the kerf, a bond holding the shield layer adjacent to the portions of the first transducer element and the second transducer element, being free of cured liquid adhesive.
2. The transducer of Claim 1 wherein the shield layer comprises a heat sealable film with an amorphous surface, the amorphous surface operable to bond the shield layer adjacent to the portions of the first transducer element and the second transducer element.
3. The transducer of Claim 1 wherein the bond comprises a fusion bond.
4. The transducer of Claim 1 wherein the bond comprises a heat sealed bond.
5. The transducer of Claim 1 wherein the kerf comprises gas without adhesive.
6. The transducer of Claim 1 further comprising a matching layer, the matching layer having an amorphous-to-crystalline thermal transition in a polymer to bond to the shield layer.

7. The transducer of Claim 1 further comprising the shield layer utilizing an amorphous-to-crystalline thermal transition in a polymer to bond to the matching layer.
8. An ultrasound transducer with at least one of an environmental and electromagnetic protection, the transducer comprising:
 - a first transducer element;
 - a second transducer element adjacent to the first transducer element, a first kerf separating the first transducer element from the second transducer element;
 - and
 - a shield layer over at least portions of the first transducer element, the second transducer element and the kerf, a bond holding the shield layer adjacent to the portions of the first transducer element and the second transducer element being of a heat seal bond.
9. The transducer of Claim 8 wherein the shield layer comprises a polyester with an amorphous surface, the amorphous surface operable to bond the shield layer adjacent to the portions of the first transducer element and the second transducer element.
10. The transducer of Claim 8 wherein the bond comprises an amorphous-to-crystalline heat seal bond.
11. The transducer of Claim 8 wherein the kerf comprises air without adhesive.
12. The transducer of Claim 8 further comprising a matching layer, wherein one of the matching layer and the shield layer utilizes an amorphous-to-crystalline thermal transition to heat seal or fusion bond to the other of the shield layer and the matching layer.
13. A method for manufacturing an ultrasound transducer with at least one of environmental and electromagnetic protection, the method comprising:

- (a) stacking at least a shield layer and transducer material;
- (b) bonding the shield layer to a portion of the stack of (a) with a heat seal bond.

14. The method of Claim 13 wherein (b) comprises heat sealing the shield layer to a portion of the stack.

15. The method of Claim 13 wherein (b) comprises bonding free of adhesive.

16. The method of Claim 13 wherein (a) comprises:

- (a1) stacking the transducer material and electrode material;
- (a2) dicing the transducer material and the electrode material; and then
- (a3) performing (b) without liquid bonding material.

17. The method of Claim 16 wherein (b) comprises bonding the shield layer without positioning bond material within a kerf between adjacent elements formed by (a2).

18. The method of Claim 13 wherein (a) comprises stacking a matching layer with an amorphous polymer surface facing away from the transducer material;

further comprising:

- (c) dicing the transducer material prior to stacking the shield layer; wherein (a) comprises stacking the shield layer on the matching layer after (c) and where (b) comprises applying heat to the amorphous polymer surface.

19. The method of Claim 13 wherein (a) comprises stacking the transducer element;

further comprising:

- (c) dicing the transducer material; wherein (a) comprises stacking the shield layer after (c), the shield layer having an amorphous polymer surface facing towards the transducer material and wherein (b) comprises applying heat to the amorphous polymer surface.

20. The method of Claim 13 further comprising:
- (d) dicing the transducer element prior to stacking the shield layer; wherein kerfs from the dicing of the transducer material are maintained free of liquid adhesive and free of solid adhesive beneath the shield layer.
21. A method for manufacturing an ultrasound transducer with at least one of environmental and electromagnetic protection, the method comprising:
- (a) stacking at least a shield layer and transducer material;
 - (b) heat sealing the shield layer to a portion of the stack of (a).
22. The method of Claim 21 wherein (b) comprises bonding the shield layer to the portion with an amorphous polymer surface on the shield layer.
23. The method of Claim 21 wherein (b) comprises bonding the shield layer to the portion with an amorphous polymer surface on the portion.
24. The method of Claim 21 further comprising:
- (c) forming kerfs within the transducer material;
- wherein (a) comprises stacking the shield layer over the kerfs, the kerfs filled with a gas and free of both of solid adhesive and liquid adhesive.
25. The method of Claim 21 wherein (b) comprises bonding the shield layer to the portion with amorphous polymer surfaces on both the shield layer and the portion.